REMARKS

By this Amendment claims 20-41 have been replaced by claims 42-58, which alternatively define the invention.

The first solution is now defined as a solution comprising seawater or brackish water. As is well documented in the art, seawater and brackish water contain impurities which cause damage to membranes used in desalination techniques. In particular, suspended particles and biological contaminants in seawater/brackish water cause membrane fouling. The presence of insoluble salts of, for example, calcium ions, may also give rise to the formation of scale on the membrane. Furthermore, biological contaminants in the seawater/brackish water can also give rise to undesirable microbiological growth on the membrane, and corrosive gases such as dissolved oxygen and hydrogen sulphide from the seawater/brackish water also cause corrosion.

In the claimed invention, a second solution is used to extract water from the first solution by direct osmosis across a first selected membrane. The second solution is formed by dissolving a selected solute in water. As well as having a higher osmotic potential than the first solution, the resulting solution is tailored to be substantially free of components that cause membrane fouling. The difference in osmotic potentials between the first and second solution causes water to flow across the first selective membrane into the second solution. The diluted second solution is then

passed through a nanofiltration membrane which separates the solutes of the second solution from the remainder of the solution.

In putting the claimed invention into practice, the present inventors found that, against all expectations, significant amounts of contaminants flowed across the first selective membrane from the first solution into the second solution. This was surprising, as the flow took place against the concentration gradient. For example, calcium ions from the first solution flowed across the first selective membrane into the second solution. In view of the larger number of insoluble calcium salts, this cross-over altered the nature of the second solution from one that was clean to one that was prone to fouling (see below).

In recognizing this unexpected problem, the present inventors included anti-corrosion, disinfectant, anti-scaling and/or anti-fouling agents in the second solution. This was not obvious, since the second solution was tailored especially to provide a clean solution that was substantially free of components that cause such fouling, scaling, corrosion and microbiological growth problems. In the absence of hindsight, therefore, the claimed invention is unobvious over the prior art.

In the first Office Action, the examiner took the view that the addition of anti-scaling agents to a feed before membrane filtration was known in the art. This is indeed the case, and anti-scaling and anti-fouling agents are routinely added to seawater and brackish water to prevent membrane fouling in, for example, conventional reverse osmosis desalination techniques. While this may make it obvious to add anti-

scaling and anti-fouling agents to the first solution, a person of ordinary skill would not think to add such agents to the second solution of the claimed invention. As explained above, the seawater or brackish water in the first solution is prone to fouling. However, the second solution of the present invention is tailored especially to ensure that it is free from contaminants that cause fouling. Accordingly, it would be counter-intuitive to add any anti-fouling an anti-scaling agents to the second solution, as one would not expect fouling to be a problem with such a clean solution.

The examiner has also pointed to the calcium and magnesium salts mentioned in previous claim 26 and suggested that a person of ordinary skill in this art would expect such salts to cause fouling. This is not entirely accurate. Although many calcium and magnesium salts are insoluble and give rise to fouling, the ones listed in claim 26 are soluble. The salts mentioned in previous claim 26 (new claim 49), therefore would not be expected to give rise to fouling *per se*. However, the cross-over of ions from the first solution may cause insoluble salts to be produced in situ and these may give rise to fouling. For example, in the case of a magnesium sulphate second solution, the cross-over of calcium ions from the first solution may give rise to the formation of insoluble calcium sulphate *in situ*, which would deposit on and clog the nanofiltration membrane. In the absence of hindsight, however, a person of ordinary skill would not have expected this cross-over to take place to any significant degree, since the flow occurs across the concentration

gradient. In the absence of hindsight, therefore, a person of ordinary skill would not expect fouling to occur in the second solution.

For the reasons outlined above, it is submitted that claim 42 is patentable.

Respectfully submitted,

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